

**CLAIMS:**

What is claimed is:

- 1 1. A storage medium load and unload apparatus for  
2 diverting a storage medium insertion impact force,  
3 comprising:
  - 4       a shuttle having a first pin with a first radius  
5 extending from a side surface of the shuttle and a  
6 protrusion having a posterior edge extending from the  
7 side surface, wherein the posterior edge is displaced a  
8 first distance from a center of the first pin; and
  - 9       a fixed side plate having a flange with a vertical  
10 edge and a first slot with which the first pin is engaged  
11 has an anterior edge and a curved posterior edge with a  
12 first width between the anterior edge and the curved  
13 posterior edge, wherein the vertical edge of the flange  
14 is displaced a second distance from the anterior edge of  
15 the first slot,
  - 16       wherein a sum of the first width and the second  
17 distance is greater than the sum of the first distance  
18 and the first radius.
- 1 2. The apparatus of claim 1, wherein the first slot has  
2 a vertical posterior edge conjoined with the curved edge  
3 and displaced vertically below the curved posterior edge,  
4 wherein a second width of the first slot at the vertical  
5 posterior edge is less than the first width.

1   3.   The apparatus of claim 1, wherein the protrusion is  
2   constrained to vertical displacements when in abutment  
3   with the vertical edge of the flange.

1   4.   The apparatus of claim 1, wherein the shuttle  
2   comprises a second pin having a second radius extending  
3   from the side surface, the second pin displaced by a  
4   third distance from the protrusion posterior edge, and  
5   the fixed plate comprises a second slot having an  
6   anterior edge and a curved posterior edge with the first  
7   width separating the anterior edge and the curved  
8   posterior edge of the second slot,

9               wherein the second pin is engaged with the second  
10   slot and a sum of the first width and the second distance  
11   is greater than a sum of the third distance and the  
12   second radius.

1   5.   The apparatus of claim 1, further comprising:  
2   a moveable side plate having a partially ramped slot with  
3   a horizontal slot portion and a ramped slot portion,  
4               wherein the first pin is engaged with the partially  
5   ramped slot.

1   6.   The apparatus of claim 5, wherein the moveable side  
2   plate comprises a horizontal slot, and the shuttle  
3   comprises a second pin extending from the side surface,  
4               wherein the second pin is engaged with the  
5   horizontal slot.

1   7. The apparatus of claim 1, further comprising:  
2   a cam having a spiral slot extending from a first radius  
3   of the cam to a second radius of the cam, wherein the pin  
4   is engaged with the spiral slot.

1   8. The apparatus of claim 7, wherein the shuttle is  
2   displaceable from an unloaded position to a loaded  
3   position, wherein an outer end of the spiral slot is  
4   positioned outside the first slot when the shuttle is  
5   positioned in the unloaded position.

1   9. The apparatus of claim 1, wherein the first slot  
2   comprises a second curved surface with the first width  
3   between the second curved surface and the anterior edge,  
4   and the shuttle comprises a second pin extending from the  
5   side surface,

6         wherein the second pin is engaged with the first  
7   slot.

1   10. The apparatus of claim 9, wherein a maximum width  
2   between the anterior edge and the first curved surface is  
3   vertically displaced by a third distance from a maximum  
4   width between the anterior edge and the second curved  
5   surface.

1   11. The apparatus of claim 10, wherein the first pin and  
2   the second pin are vertically displaced by the third  
3   distance.

1   12. The apparatus of claim 1, wherein a width of the  
2   first slot tapers from the first width to a second width  
3   less than the first width.

1   13. The apparatus of claim 12, wherein the second width  
2   is located vertically below the first width.

1   14. The apparatus of claim 1, wherein the first pin is  
2   rectilinearly displaceable within the first slot.

1   15. A load and unload apparatus for diverting an impact  
2   force applied to the load and unload apparatus,  
3   comprising:

4         a shuttle having a cavity configured to accept a  
5   storage medium;

6         an elevator mechanism for reciprocally elevating and  
7   lowering the shuttle; and

8         an impact diversion mechanism for diverting an  
9   impact force resulting from insertion of the storage  
10   medium into the cavity in the shuttle,

11         wherein the impact diversion mechanism diverts the  
12   impact force to a side surface of the shuttle.

1   16. The load and unload apparatus of claim 15, wherein  
2   the impact diversion mechanism comprises a protrusion  
3   extending from the side surface and a flange located  
4   within the apparatus.

1   17. The load and unload apparatus of claim 15, wherein  
2   the impact diversion mechanism comprises a flange located  
3   on a fixed side plate of the apparatus.

1   18. The load and unload apparatus of claim 17, wherein  
2   the impact diversion mechanism further comprises a  
3   protrusion extending from the side surface of the shuttle  
4   that is brought into abutment with the flange on  
5   application of the impact force to the shuttle.

1   19. The load and unload apparatus of claim 15, further  
2   comprising:

3         a pin extending from the side surface; and  
4         a slot having a tapered width, wherein  
5             the pin is engaged with the slot at a first position  
6   in the slot having a first width when the shuttle is  
7   located in an unloaded position for reception of the  
8   storage medium.

1   20. The load and unload apparatus of claim 19, wherein  
2   the shuttle is reciprocally displaceable from the  
3   unloaded position to a loaded position,  
4         wherein the pin is engaged with the slot at a second  
5   position in the slot having a second width when the  
6   shuttle is located in the loaded position, the first  
7   width greater than the second width.